Proposal for Bren School of Environmental Science and Management Group Project

Project Title
Evaluate the Current State of the Art for Models and Data for Predicting the Potential for Cumulative Environmental Impacts of Timber Harvesting on Nonfederal Timberlands in California

Project Proposers

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A) Objectives. This Group Project's overall goal is to review and document the state of the art in available models and data for cumulative environmental impact assessment on forested watersheds in California, develop approaches for integrating these models to provide a cumulative effects risk analysis, and engage with any or all of the current state-led efforts as case studies. These four efforts are (1) the Campbell Creek Planning Watershed Pilot Project, led by the California Natural Resources Agency (CNRA) and the Timber Regulation and Forest Restoration Program (TRFRP), (2) the Cannabis Information and Prioritization System (CIPS), led by the Central Valley Regional Water Quality Control Board, (3) development of ecological performance measures by CNRA and TRFRP, and (4), CAL FIRE's Forest Practice Watershed Mapper. The intention is for the Project's outputs to be useful for cumulative effects assessment related to timber management and cannabis 'cultivation on nonfederal timberlands. Anticipated users of the resulting models include state and local agencies with natural resource protection responsibilities, proponents of timber management and cannabis production projects, tribes, and other stakeholders, such as environmental organizations.

The purpose of a new model will be to accurately forecast the likely risks of adverse cumulative impacts (CIs) of any given timber harvesting plan (THP), cannabis grow site, and/or other development effort in a given watershed location. Better forest management decisions result in better environmental outcomes, and an open, transparent model in which the interagency teams, project proponents, and all other stakeholders use the same credible, agreed-upon data, and preferably the same agreed-upon analytical tools, should foster this. The new model will integrate ecological performance measures, such as those being developed by the CNRA/TRFRP, as part of a transparent risk assessment tool. It also should look to the work that the Board of Forestry and Fire Protection's Effectiveness Monitoring Committee is doing to evaluate the effectiveness of the Forest Practice Rules and related regulations.

B) Significance. California's Supreme Court in *Bayside Timber Co. vs. Board of Supervisors* (1971) held that, "few, if any industries adversely affect the rights of others and the public generally, as do timber and logging operations." When that opinion was written the impact of destructive logging practices upon water quality, wildlife habitat, and recreation values was less understood than it is today. Now, additional concerns have created urgency in addressing CIs: forests' role in both release and storage of greenhouse gases and their ability to be resilient to climate change and associated disturbances (increased wildfire likelihood and severity, spikes in insects and diseases, and changing precipitation regimes).

Additionally, in recent years, the proliferation of marijuana cultivation in California's forests has added a new set of environmental impacts that must be considered both individually and cumulatively. The State's regulatory apparatus to address these impacts, via regulation, permitting, and enforcement across multiple state agencies has been growing of late. The Central Valley Regional Water Quality Control Board has led the development of a new risk-based assessment tool (the Cannabis Information and Prioritization System, or CIPS) to support these assessment efforts. This project provides a critical, objective, timely and academic opportunity to integrate the various, parallel efforts going on within the State and both the Natural Resources Agency and the Board of Forestry welcome and support this important proposal.

The Campbell Creek Planning Watershed, located about six miles northeast of Fort Bragg, California, could serve as one case study for the development of this geospatial model. Students will utilize existing data from the Lyme Redwood Forest Company, state and federal agencies, and other sources. Work will be in conjunction with the Campbell Creek Planning Watershed Pilot Project, now in progress under the leadership of the California Natural Resources Agency and in partnership with CalEPA; a multidisciplinary team of interagency representatives and public stakeholders comprise the Campbell Creek Pilot Project Working Group. The web-based model will then be available for use and ongoing and unlimited development, enhancement and expansion by all nonfederal forestlands stakeholders in the region and state. The work of the Campbell Creek Pilot Project is guided by the Forest Planning and Watershed Pilot Projects Concept paper, dated May 26, 2016 (http://resources.ca.gov/wp-content/uploads/2014/07/Planning-Watershed-Pilot-Projects-Concept-Paper-Implementation-Draft-May-25-2016.pdf).

C) Background. The California Environmental Quality Act (CEQA) [Public Resources Code (PRC) § 21000 et seq.], CEQA Guidelines [Title 14 California Code of Regulations (CCR) § 15000 et seq.], Z'Berg-Nejedly Forest Practice Act of 1973 (FPA) (RPC § 4511et seq.), and California Forest Practice Rules (14 CCR § 895 et seq.) together require that cumulative impacts (CI) must be assessed—for proposed logging or other commercial development projects on nonfederal timberlands. These assessments must consider "past, present, or reasonably foreseeable probable future projects" whose impacts may interact with those of the proposed project. CI assessment is arguably one of the most far-reaching and important environmental provisions of CEQA and related environmental regulatory programs, such as forest practice regulation.

In the past, California's lack of meaningful CI assessment has been noted and strongly criticized in blue-ribbon science reports, by the state's Little Hoover Commission (1994), by grant-making foundations, by federal agencies such as the U.S. Fish and Wildlife Service, and has been the subject of considerable litigation. Today, much progress has been made by THP submitters and the inter-agency timber harvest review team to address the challenges of CIs since the 2001 Dunne Report, *A Scientific Basis for the Prediction of Cumulative Watershed Effects*. While there previously were frequent lawsuits against CAL FIRE and the Board of Forestry and Fire Protection over the legal inadequacy of THP cumulative affects assessment, suits which the state often lost, ligation over these issues has largely disappeared of late as the state has been more consistently successful in defending THP cumulative impact assessments.

The present approach to CI assessment in THPs consists of the project applicant filling out a one-page summary checklist form and providing the data and analysis to support those conclusions in the THP document. The checklist requires responses indicating whether the proposed project would result in significant potential adverse environmental effects, with or without mitigation, for seven parameters, including watershed, soil productivity, biological, and other parameters. Project proponents have significant discretion in selecting the

methods and data they use to assess cumulative impacts. CalWater "planning watersheds," typically 3,000 to 10,000 acres in size, —and there are nearly three thousand forested planning watersheds in the state, are one of the primary units of analysis used per the Forest Practice Rules.

D) Available data. Significant datasets available through the agency partners (primarily GIS) may include, at student discretion, the following:

- Multiple datasets developed as a part of the Campbell Creek Planning Watershed Pilot Project ;
- Level 1 LiDAR data soon to be available for a substantial area of coastal Mendocino County;
- GIS Timber harvest history compiled by the Dept of Forestry and Fire Protection (CAL FIRE); including roads and hydrology
- Fuels reduction projects from CalMAPPER GIS (Dept of Forestry and Fire Protection);
- California Natural Diversity Database (Dept of Fish and Wildlife);
- CalWater Planning Watersheds.
- Datasets developed for CIPS;
- Soil survey (Natural Resources Conservation Service)
- Geology and geomorphology (California Geological Survey)

E) Possible approaches

- Conduct a comprehensive literature and Internet review of available models and data for forested watershed cumulative effects assessment; canvass knowledgeable practitioners and academics for information on such models and data sets.
- Review and assess Campbell Creek Pilot Project watershed data sets and integration efforts to date.
- Review CIPS data sets and risk assessment functions and how they have been put to use by state agencies.
- Review the Forest Practice Watershed MAPPER . the eEHR Mapper and other CAL FIRE timber harvest databases to evaluate their potential for assessing CIs.
- Share the findings with the agencies and interested stakeholders.
- Develop an integrated spatial model to assess relative risk, as recommended in the 2001 Dunne report for use by the agencies, land managers, and the interested public. This would be a valuable outcome, with the potential for far reaching and significant impacts to improve management of the risks in these critical watersheds. To the extent possible, the model should be useable across all forested watersheds in the state.

F) Deliverables:

- Review and analysis of current efforts representing the "state of the art" in order to inform future integration of spatial models for predicting risk.
- Development of a new watershed risk model that builds on the current efforts and offers a truly independent, science-based tool for interagency and stakeholder interaction and analysis in order to promote shared understanding of risks.
- Student presentation to the State Board of Forestry and Fire Protection, as well as a public workshop in Sacramento, to share results and engage the public.

G) Internships. We have the capacity and desire for 10-week summer internships for up to two students, with mentoring and home base desks provided through the University of California's Hopland Research and Extension Center (http://hrec.ucanr.edu/) and/or in partnership with Jackson Demonstration State Forest in Fort

Bragg at their Forestry Learning Center. Funding support for students to be explored through partnerships in this effort but not yet confirmed beyond housing and limited travel support.